WHAT IS CLAIMED IS:

1. An armature of a rotary electric machine, the rotary electric machine comprising

an armature on which a plurality of coils are formed by making a winding wire wound in the slots with a predetermined number of slots therebetween out of a plurality of slots provided side by side in a circumferential direction conduct an electric current to adjoining commutator segments and

a yoke provided with magnetic poles,

wherein the number of slots are half the number of commutator segments, and

the coils are formed as each pair of coils that respectively conduct an electric current to commutator segments adjoining at both sides in the circumferential direction with reference to an arbitrary commutator segment,

the pair of coils facing opposite poles positioned different from each other, and one coil being wound in a normal winding state, and the other coil, in a reverse winding state.

2. The armature of a rotary electric machine according to claim 1, wherein the rotary electric machine is formed with N magnetic poles, n pieces of slots, and 2n pieces of commutator segments, a pair of coils that respectively conduct an electric current to three commutator segments adjoining at both sides in the circumferential direction with reference to an arbitrary commutator segment have an angle of approximately (360/N), and

one thereof is wound as a normal winding coil, and the other, as a reverse winding coil.

3. The armature of a rotary electric machine according to claim 1, the rotary electric machine comprising N magnetic poles, n pieces of slots, and 2n pieces of commutator segments, wherein a number (2n/N) obtained by dividing the number of commutator segments by the number of magnetic poles is a natural number, and ((2n/N)−1) coils formed in a manner respectively conducting an electric current to (2n/N) pieces of arbitrary commutator segments adjoining in the circumferential direction have an angle of approximately {(1+2m)×(360/N)} where m is a natural number including 0 and are wound so that a normal winding alternates with a reverse winding.

4. The armature of a rotary electric machine according to claim 1, 2, or 3, wherein the coils are wound with one slot therebetween.

5. An armature of a rotary electric machine, the rotary electric machine comprising

an armature on which a plurality of coils are formed by making a winding wire wound in the slots with a predetermined number of slots therebetween out of a plurality of slots provided side by side in a circumferential direction conduct an electric current to adjoining commutator segments and

a yoke provided with magnetic poles,

wherein the number of slots are half the number of

commutator segments, and

the coils are formed as each pair of coils that respectively conduct an electric current to commutator segments adjoining at both sides in the circumferential direction with reference to an arbitrary commutator segment,

the pair of coils facing the same poles positioned different from each other,and the respective coils being wound in the same winding direction.

6. The armature of a rotary electric machine according to claim 5, wherein the rotary electric machine is formed with N magnetic poles, n pieces of slots, and 2n pieces of commutator segments, a pair of coils that respectively conduct an electric current to three commutator segments adjoining at both sides in the circumferential direction with reference to an arbitrary commutator segment have an angle of approximately (360×2/N), and respective coils are wound in the same winding direction.

7. The armature of a rotary electric machine according to claim 5 or 6, wherein the coils are wound with one slot therebetween.

8. The armature of a rotary electric machine according to any of claims 1 through 7, wherein the armature comprises two layers of coils wound in the radial direction, and with reference to an arbitrary slot, a pair of first coils in the radial direction to be wound with the arbitrary slot therebetween and a pair of second coils in the radial direction to be wound with a slot

adjoining the arbitrary slot therebetween are wound at a winding amount based on a preset ratio.

9. The armature of a rotary electric machine according to claim 8, wherein in the first coils and second coils each pair of coils are wound with a positional displacement from each other in the radial direction.

10. The method for producing an armature of a rotary electric machine according to any of claims 1 through 9, wherein adjoining slots are formed so that a groove width of one slot is narrower at an inner diameter side and wider at an outer diameter side and a groove width of the other slot is wider at an inner diameter side and narrower at an outer diameter side.

11. A method for producing an armature of a rotary electric machine, the rotary electric machine comprising

an armature on which a plurality of coils are formed by making a winding wire wound in the slots with a predetermined number of slots therebetween out of a plurality of slots provided side by side in a circumferential direction conduct an electric current to adjoining commutator segments and

a yoke provided with magnetic poles,

wherein the number of slots are half the number of commutator segments, and

the coils are formed as each pair of coils that respectively conduct an electric current to commutator segments adjoining at

both sides in the circumferential direction with reference to an arbitrary commutator segment,

the pair of coils disposed so as to face opposite poles positioned different from each other, and one coil being wound so as to be in a normal winding state, with the other coil wound in a reverse winding state.

12. The method for producing an armature of a rotary electric machine according to claim 11, wherein the rotary electric machine is formed with N magnetic poles, n pieces of slots, and 2n pieces of commutator segments, a pair of coils that respectively conduct an electric current to three commutator segments adjoining at both sides in the circumferential direction with reference to an arbitrary commutator segment have an angle of approximately (360/N), and one thereof is wound as a normal winding coil, and the other, as a reverse winding coil.

13. The method for producing an armature of a rotary electric machine according to claim 11, the rotary electric machine comprising N magnetic poles, n pieces of slots, and 2n pieces of commutator segments, wherein a number (2n/N) obtained by dividing the number of commutator segments by the number of magnetic poles is a natural number, and ((2n/N)-1) coils formed in a manner respectively conducting an electric current to (2n/N) pieces of arbitrary commutator segments adjoining in the circumferential direction have an angle of approximately {(1+2m)×(360/N)} where m is a natural number including 0 and are

wound so that a normal winding alternates with a reverse winding.

14. The method for producing an armature of a rotary electric machine according to claim 11, 12, or 13, wherein the coils are wound with one slot therebetween.

15. A method for producing an armature of a rotary electric machine,

the rotary electric machine comprising

an armature on which a plurality of coils are formed by making a winding wire wound in the slots with a predetermined number of slots therebetween out of a plurality of slots provided side by side in a circumferential direction conduct an electric current to adjoining commutator segments and

a yoke provided with magnetic poles,

wherein the number of slots are half the number of commutator segments, and

the coils are formed as each pair of coils that respectively conduct an electric current to commutator segments adjoining at both sides in the circumferential direction with reference to an arbitrary commutator segment,

the pair of coils disposed so as to face the same poles positioned different from each other, and each coil being wound in the same winding direction.

16. The method for producing an armature of a rotary electric machine according to claim 15, wherein the rotary electric

machine is formed with N magnetic poles, n pieces of slots, and 2n pieces of commutator segments, a pair of coils that respectively conduct an electric current to three commutator segments adjoining at both sides in the circumferential direction with reference to an arbitrary commutator segment has an angle of approximately (360/N), and respective coils are wound in the same winding direction.

17. The method for producing an armature of a rotary electric machine according to claim 15 or 16, wherein the coils are wound with one slot therebetween.

18. The method for producing an armature of a rotary electric machine according to any of claims 11 through 17, wherein the armature comprises two layers of coils wound in a radial direction, and with reference to an arbitrary slot, a pair of first coils in the radial direction to be wound with the arbitrary slot therebetween and a pair of second coils in the radial direction that are wound around the arbitrary slot and adjoining the first coils in the circumferential direction are wound at a winding amount based on a preset ratio.

19. The method for producing an armature of a rotary electric machine according to claim 18, wherein in the first coils and second coils, each pair of coils are wound with a positional displacement from each other in the radial direction.

20. The method for producing an armature of a rotary electric machine according to any of claims 11 through 19, wherein adjoining slots are formed so that a groove width of one slot is narrower at an inner diameter side and wider at an outer diameter side and a groove width of the other slot is wider at an inner diameter side and narrower at an outer diameter side.